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ENTOMOLOGICAL NEWS

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PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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IN the last number of the NEWS was published an interesting account of the early history and organization of the American Entomological Society, in which it was stated that its first president was Dr. John L. LeConte. It will no doubt be of great interest to our readers, especially those interested in Coleoptera, to see a portrait of the man who did so very much to advance our knowledge of that order of insects. Dr. LeConte died on Nov. 15, 1883, aged 58 years, and was succeeded by Dr. G. H. Horn as President of the American Entomological Society and Director of the Entomological Section of the Academy of Natural Sciences of Philadelphia. An interesting biographical sketch of Dr. LeConte is given in Vol. XI of the Transactions of the American Entomological Society.

THE journal of the New York Entomological Society, which has just emerged from its chrysalis condition, makes a very fine appearance in its first number, and we wish it long life and much prosperity, and hope that the "*tumble-bug*" may never cease rolling. The first plate is very fine, and the journal is well printed, and the articles are interesting and of value. An American journal of this character has been badly needed, and will help take the pressure of too much manuscript from the NEWS, which will facilitate the early appearance of papers.—ED.

Geographical Distribution of the Carabidæ.

By F. M. WEBSTER, Wooster, Ohio.

In the "Popular Science Monthly," vol. xlii, p. 191, December, 1892, Mr. Henry A. Pilsby, in speaking of the more complex obstructing mechanism in many of the snails of the Southern States and South America, and, citing especially, *Caracolas labyrinthus*, from Panama, says: "These Southern forms represent the highest development of the three-toothed type of aperture. The meaning of this increasing complexity appears, when we remember that the regions where the most complicated types of snails are found, are known to be practically coincident with the regions producing carnivorous Coleoptera in the greatest numbers and in the most exuberant variety of forms."

The above statements are considerably at variance with what I had supposed to be the generally accepted opinion, among entomologists, and is quite contrary to my own observations, though these have been somewhat limited. Wollaston, in his work "On the Variation of Species with Especial Reference to the Insecta," p. 28, states that "The great preponderance of the phytophagous over the predaceous tribes, in the hotter regions of the earth, is a remarkable fact, and strongly suggestive of the relation which the insect and vegetable worlds (both of which attain their maximum in those zones) bear to each other." Furthermore, Mr. Darwin, who had previously remarked this fact ("Journal of Researches," p. 34) says that "the carnivorous beetles, or Carabidæ, appear in extremely few numbers within the tropics. The carrion feeders and *Brachelytra* are very uncommon; on the other hand, the Rhynchophora and Chrysomelidæ, all of which depend on the vegetable world for subsistence, are present in astonishing numbers."

In his list of the Coleoptera of New Zealand, Capt. Thomas Brown gives the names of 148 species of Carabidæ and 299 of Rhynchophora. A week's observation in the vicinity of Hobart, Tasmania, in mid-Summer, illustrated, quite forcibly, the similarity of the coleopterous fauna with that of New Zealand, as regards to the matter in question. While I observed Rhynchophora and Chrysomelidæ in abundance, very few Carabidæ were seen. True, these islands lay within the temperate zone, but their climate is sub-tropical, like that of extreme southern United

States. In North America, north of Mexico, the Carabidæ outnumber the Rhynchophora in number of species.

It seems not improbable that the three obstructing teeth on the rim or lip of the aperture of the shell in the molluscs mentioned by Mr. Pilsby, may serve to protect the occupant from its enemies, and, possibly, some of these may be predaceous beetles. But if this be true, there must be another more powerful enemy than predaceous Coleoptera, and one with which the writer of the notice is unacquainted, that causes the peculiar dentition, else the result could not be, as he says, that the highest development appears to the southward, but quite the reverse.

———o———

THE COLEOPTERA OF ALASKA.

By JOHN HAMILTON, M.D., Allegheny, Pa.

A Catalogue of the Coleoptera of the vast territory of Alaska was commenced near two years ago, and is now approaching completion. The synonymy and distribution of the species are given, and likewise a list of places in Alaska where Coleoptera have been taken, with the longitude and latitude of each place. The following summary may interest entomologists:

Number of families, 45; number of genera, 251; number of species, 572. Number of species common to both hemispheres, 137; number of species occurring in Alaska and other parts of North America, 240; number of species occurring in Alaska and not recorded as occurring elsewhere, 175; number of species imported by commerce, 17; number of species doubtfully Alaskan, 3; number of species occurring in Northern Asia and Alaska not recorded as occurring in other parts of North America, 33; number of species taken on the coast of Behring Strait and along the lower Yukon, 28; number of species taken on the continent or mainland in Alaska, 60. Many of these occur also in the peninsulas, islands and other parts of North America, and some of them likewise in Northern Asia.

In the year A. D. 1853, Prof. C. G. Mannerheim completed the publication of a catalogue of all the Alaskan Coleoptera known to him, numbering 540 species; some of these have become synonyms of one another—how many, has not been counted. It will be seen that, in the aggregate during the past 40 years,

this number has only been increased by 32 species. Placing Mannerheim's species in the families corresponding to those now adopted, the following list shows the difference in that and the present catalogue by families. The figures following the family are the number of species in this catalogue; the second series, those in Mannerheim's.

Amphigoidæ, 1 1; Anthicidæ, 1 1; Buprestidæ, 5 4; Byrrhidæ, 7 6; Calandridæ, 2 2; Carabidæ, 128 114; Cerambycidæ; 17 18; Chrysomelidæ, 12 12; Ciodidæ, 4 4; Cleridæ, 2 2; Coccinellidæ, 7 5; Colydidæ, 2 2; Cryptophagidæ, 16 15; Cucujidæ, 8 8; Curculionidæ, 23 19; Dascyllidæ, 1 1; Dermestidæ, 2 2; Derodontidæ, 2 2; Dytiscidæ, 33 34; Elateridæ, 30 31; Gyrinidæ, 1 1; Haliplidæ, 1 1; Heteroceridæ, 1 1; Hydrophillidæ, 13 14; Lampyridæ, 9 7; Latrididæ, 16 15; Melandryiidæ, 5 4; Meloidæ, 1 1; Mordellidæ, 2 2; Nitidulidæ, 13 15; Oedemeridæ, 1 1; Platypsyllidæ, 1 0; Pselaphidæ, 5 3; Ptinidæ, 3 3; Pyrochroidæ, 2 1; Pythidæ, 4 4; Scarabæidæ, 5 6; Scolytidæ, 18 20; Scydmænidæ, 3 3; Silphidæ, 28 33; Spondylidæ, 1 1; Staphylinidæ, 120 107; Tenebrionidæ, 7 6; Trogositidæ, 7 6; Trichopterygidæ, 8 5.

———o———

Additions to the Hymenoptera of Jamaica.

By T. D. A. Cockerell.

Having just prepared a list of the Hymenoptera of this island, I find I have notes on a few species apparently not yet recorded, as follows: 1. *Catolaccus* sp. [L. O. Howard]; Kingston.—2. *Cothonaspis* sp. [L. O. Howard]; Kingston.—3. *Cyrtogaster* sp. [C. V. Riley]; bred from cocoons of *Apanteles* found by Mr. Fawcett at Cinchona. This is the insect doubtfully referred to *Lamprostylus* in In. Inst. Ia., 1892, p. 43.—4. *Dorymyrmex pyramicus* Rog. [Riley]; at flowers of fennel, Mandeville; and on corn (*Zea*) in Kingston.—5. *Ectatomma* (*Holcoponera*) *concentricum* Mayr., [E. André]; Moneagne.—6. *Holcopelte* sp. [L. O. Howard]; a green species with white legs, bred by Mr. J. J. Bowrey from cocoons of *Apanteles*.—7. *Larra* (*Notogonia*) *trifasciata* Sm. [W. J. Fox]; Kingston, given to me by Mr. L. M. Lynch, who informed me that it had stung a lady, who was thereupon taken severely ill. Dr. Phillippi attended the case. I suppose this is an instance of idiosyncrasy, comparable to many

others recorded from time to time.—8. *Macrotelia floridana* Ashm. [L. O. Howard]; one found on a window at Manchester Cottage, Kingston.—9. *Smicra femorata* Fab.; there is a specimen from Jamaica in the British Museum marked *S. punctata* Fb., which, according to Mr. Kirby (In. Linn. Soc. 1882, p. 66), is a synonym of *femorata*. However, Mr. Kirby considers *S. nigropicta* Cress., which has been recorded from Jamaica by Mr. Fox, also a synonym of *femorata*.—10. *Tapinoma melanocephalus* Fab. [Riley]; in decaying tamarinds, East Street, Kingston; and on corn (*Zea*) in Kingston.

The authorities for the identification of the species are given in square brackets after the describers. This method of citation is new or unusual, but I would venture to suggest its adoption by writers who have insects identified for them. It is only fair to those who identify species, that they should get the credit due to them, and further, the value of a list is greatly increased when we know who is responsible for the identifications. This being granted, the method here employed has the advantage of clearness and brevity. When no authority is cited in this way, it should be assumed that the writer identified his own species, or that the records are not new. When the record refers only to specimens *compared* by the writer with other specimens identified by a specialist, it is not fair to cite the specialist as authority, since the writer might have made some mistake.

———o———

Two weeks in Richmond County, North Carolina.

By Frank M. Jones, Wilmington, Del.

In the March number of the News is given a list of the Lepidoptera captured by Messrs. Skinner and Laurent in Mitchell County, North Carolina, between the dates of July 7th and 21st. One month later, I collected for a similar length of time in Richmond County in the south central part of the same State, and for a few hours in the vicinity of Wilmington, N. C., and as the insect fauna of the one locality (Mitchell County) is that of the mountains, and of the other that of the warm and moist lowlands, a comparison of the species met with may be of interest.

The soil of Richmond County is extremely sandy, and but little of the land is under cultivation. Although a greater variety of trees are to be found in the moist hollows and along the

small streams or "branches," pines and oaks are almost exclusively the trees of the higher ground. Along the "branches" the collecting is excellent, especially at the flowers of *Clethra alnifolia*, at which nearly all of the diurnals were captured, and in the clearings, though often a tangle of high grass and rank-growing plants, Pamphilæ especially abounded.

Fifty-seven species of butterflies were met with, including one new species, since described by Dr. Skinner as *Pamphila carolina*. The three species marked with a * occurred at Wilmington, N. C., and not in Richmond County.

LIST OF BUTTERFLIES.

Danais archippus,
Euptoieta claudia,
Phyciodes tharos,
Grapta interrogationis,
Pyrameis huntera,
Junonia cœnia,
Limenitis ursuta,
Limenitis disippus,
Debis portlandia,
Neonympha areolatus,
Neonympha sosybius,
Satyrus alope,
Libythea bachmani,
Calephelis borealis,*
Thecla halesus,
" *m-album*,
" *melinus*,
" *pœas*,
Chrysophanus hypophlæas,
Lycæna pseudargiolus.
Lycæna comyntas,
Pieris rapæ,
Calopsilia eubule,
Meganostoma cæsonia,
Terias nicippe,
" *lisa*,
" *jucunda*,
Papilio ajax,*
" *turnus*,
Papilio turnus glaucus,
" *asterias*,
" *troilus*,
" *palamedes*,
" *philenor*,
Ancyloxypha numitor,
Pamphila campestris,
" *phylæus*,
" *brettus*,
" *otho*,
" *cernes*,
" *verna*,
" *accius*,
" *maculata*,*
" *vitellius*,
" *fusca*,
" *arogos* Bd.-Lec.
" *carolina*,
Amblyscirtes vialis,
Amblyscirtes textor,
Pyrgus tessellata,
Nisoniades martialis,
" *juvenalis*,
" *petronius*,
Pholisora catullus,
Eudamus bathyllus,
" *lycidas*,
" *tityrus*.

Debis portlandia, *Neonympha areolatus* and *sosybius*, and *Satyrus alope*, were all quite common, as were also *Thecla halesus* and *T. melinus*. *Terias jucunda* was extremely common among

the scrub-oaks; all of the Papilios were rather rare, and not a single *Colias* or *Argynnis* was seen; with the exception of *Pamphila maculata*, *P. arogos* and *P. carolina*, none of the Pamphilæ mentioned were rare, and *otho*, *accius* and *vitellius*, were quite abundant.

Of the moths, about seventy species were taken. *Chærocampa tersa* occurred at flowers, and the larva was found feeding on *Diodia teres*. At sugar, the larger Catocalæ occurred sparingly, *ilia* and *cara* being the only species taken; but *elonympha* came in swarms, as did also *Homoptera edusa*, *Zale horrida* and many less common species. *Exyra ridingsii* occurred as larvæ, pupæ and perfect insects, in the large trumpet-shaped leaves of a species of pitcher-plant (*Sarracenia flava*). These leaves or "trumpets." are excellent traps for a great variety of insects. Coleoptera seem to predominate, and although the specimens in the bottom of the "trumpet" are partly digested, and, as a rule, unrecognizable, those near the top are often alive and in perfect condition. The largest moth taken from one of these natural traps was *Agrotis ypsilon*, and smaller species were of frequent occurrence.

The suggestion made by Dr. E. Kunze (ENT. NEWS, vol. ii, p. 174) that collectors should plant *Clethra alnifolia* in their gardens is certainly a good one, for the blossoms of this plant are not only attractive to swarms of day-flying insects, but are also visited by many more at night.

———o———

ELEMENTARY ENTOMOLOGY.

LEPIDOPTERA–HETEROCERA (Moths).

By Prof. JOHN B. SMITH, New Brunswick, N. J.

Next in order in our lists follows the Noctuid series, comprising the Thyatiridæ, Noctuidæ and Brephidæ, the former a link to the Bombyces, the latter to the Geometridæ. In a general way these families agree in venation, but there is not otherwise any very strong band of union between them.

The Thyatiridæ have a moderately robust body with a comparatively short thorax, long abdomen and large wings, resembling the Notodontidæ quite strongly in these features. The thoracic tufting is evident in most cases, showing a very decided

tendency to form a divided median crest, uplifted patagiæ and a circular, disc-shaped collar. In venation the primaries have a furcate dorsal or internal vein, 5 belonging to the median series and near to 4, and accessory cell often, though not universally present. There is considerable variation, even within specific limits, in the distribution of the veins at the end of the subcostal, and even the two opposite wings of the same specimens may differ to some extent. The location of vein 5, which is an essential point, is constant, and separates the family from the Notodontidæ. The secondaries in the typical series have the costal vein sinuate, and the subcostal branched before the end of the cell; in *Leptina* these characters are scarcely marked enough to attract attention at first glance; but these are the characters of venation which separate them from the Noctuidæ. Vein 5 is nearest to 4, as on the fore wings. It is quite likely that the essential family character of the Thyatiridæ has escaped us thus far; certainly *Leptina* scarcely fits into the characters drawn from *Bombycia* or *Thyatira*. In our fauna we have very few species, and some of these are very rare. The species grouped under *Bombycia* in my list are certainly not congeneric, but I have never had all of them together at one time for careful study.

In the Noctuidæ we have a very great diversity of appearance, size and wing form, as well as a very great diversity in the form and habits of the larva, and yet, up to the present time, it has not proved possible to divide the family satisfactorily. The primaries have a more or less evidently forked dorsal or internal vein, vein 5 nearer to 4 than to 6, and an accessory cell present, except in rare instances. The secondaries have the costal vein free from the base, usually joining the subcostal close to its origin and forming a small cell at the base, but never connected by a transverse vein. Rarely the costal arises out of the subcostal, and we then have a structure almost indistinguishable from the Arctiidæ. Vein 5 belongs to the median series, and is not remote from 4. There are two simple internal veins. As a whole, the venation is very constant, and where aberrations occur, they are rarely such as to cause doubt whether or not the insect is referable to the Noctuidæ. In body structure the insects are usually robust, with an approximately quadrate, convex thoracic dorsum, a distinct, though not prominent head, and a proportionate, cylindric or cylindriconic abdomen, ordinarily not extending beyond

the hind angles of the secondaries. The wings are usually rather small in proportion to the body and the primaries are trigonate, with marked, though rarely pointed apices. The ocelli are present, except in rare instances, and as a rule the tongue is well developed. The legs are usually well developed, moderate in length, the posterior longest, tibiæ of median pair with terminal spurs, those of posterior pair with middle and terminal spurs. The anterior tibia has, in lieu of spurs, an epiphyses on the inner side, covering an excavation which occupies a greater or less extent of the member. While the above characterizes the normal form of the Noctuidæ, there are numerous departures from the type. The head, instead of being moderate only, may become prominent, or it may, on the other hand, become reduced in size, retracted and bombyciform in appearance. The tongue, while it never becomes excessively long, may dwindle and become obsolete, and this is usually associated with a retracted head. The palpi vary in every possible way, from the small tubercles which are hardly perceptible, to the prominent, rostrate type found in the Deltoids. The antennæ are as variable; in the females they are usually setaceous or bristle-form, but by no means always; in the males they range from setaceous to broadly pectinated, though never to the doubly pectinated type; sometimes there are other peculiarities in the male antennæ, like the knots in *Renia*, or the peculiar twists in *Herminia*. These variations in the appendages of the head furnish good characters for generic divisions, and, in addition, the character of the frontal structure and of the frontal clothing, as well as of the eyes, are made use of. In the great majority of cases the eyes are naked, hemispherical, are not particularly prominent; sometimes they will become almost globose, and the most conspicuous feature of the head; or, on the contrary, they may be reduced to lentil-shaped discs, or may loose their round form altogether and become reniform, or kidney-shaped. Sometimes we find at the margins a fringing of long hair overhanging the eyes, and they are then said to be lashed; again, there may be a clothing of more or less conspicuous hair on the surface, a single hair from each facet, set in one of the angles. Lashed eyes usually accompany a somewhat retracted head, and are more usual in the *Xyliniform* series. The front varies quite frequently, and while the great bulk of the species have it smooth and not modified in any way, we often find

it roughened and protuberant; or with a cup-like depression, in which there is usually a tubercle or other process; or there may be a conic projection, with or without a depression at the tip; sometimes instead of a conic protuberance or a depression, we have a flattened, plate-like projection varying in form, and generic characters are furnished by these modifications. It is quite a characteristic of the fauna of the elevated Western plateaus that the majority of the species have the front modified in some way, while along the Atlantic coast and in the Northeastern and central portions of our country this character is somewhat exceptional. The clothing of the head may be hairy or scaly; smoothly applied or forming tuftings, and we get some generic characters here.

(To be continued.)

PHIDIPPUS OPIFEX McCook.—In that admirable work on American Spiders by Dr. H. C. McCook, he says: "I know no Saltigrade and no Lateragrade that produces more than one cocoon, although of the former Stavely says that *Epiblemum scenicum* makes one or two, and of the latter that *Philodromus cæspiticolis* deposits two flattened cocoons in a large nest."

I have repeatedly gathered the cocoon nests of this *Phidippus* in searching for parasites on their eggs, and have seldom, or ever, found one with less than two cocoons, and I have found them with as many as four; three is a very common number.

The nests may generally be found in the centre of some foot-hill shrub of Sage or Encelia, the illustration thereof as given by Dr. McCook is very typical. In the seclusion of her nest the female first spins a shallow disc, in which the eggs of a pinkish red color are placed; over this, but quite separate from it, she weaves a cover larger but less firm in texture and pats it down so uniformly as to leave the lid impressed exactly like a thimble top. The convex sides are made to adhere by a few loose threads wound round at their junction and finally covered over with a sheet of web that separates it from the cell occupied by the female. The young all hatch out in August or September, and in their growth naturally separate the sides and escape into the surrounding cottony mass, where they safely remain until the Spring.—ANSTRUTHER DAVIDSON, M. D., Los Angeles, Cal.

THE following has been received: Agricultural College, Las Cruces, N. Mex., U. S. A., May 1, 1893. Please take note that my address, *after June 1, 1893*, will be as follows: C. H. Tyler Townsend, Curator of Museum, Institute of Jamaica, Kingston, W. Indies.

We wish Prof. Townsend all prosperity in his new field of labor.

ENTOMOLOGICAL NEWS.

Published monthly (except July and August), in charge of the joint publication committees of the Entomological Section of the Academy of Natural Sciences, of Philadelphia, and the American Entomological Society. It will contain not less than 300 pages per annum. It will maintain no free list whatever, but will leave no measure untried to make it a necessity to every student of insect life, so that its very moderate annual subscription may be considered well spent.

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PHILADELPHIA, PA., JUNE, 1893.

THE latest number of "Insect Life" (April, 1893, p. 215) contains the following comment on the department of Entomological Literature of the NEWS:

"Entomological News . . . . no longer gives abstracts of the contents of foreign entomological journals, or of only such items as refer to American entomology . . . . [This] innovation we regret and must view as a retrogression; for if there was one feature which made *Entomological News* unique and useful to all entomologists it was this bibliographical department. Even those who have access to the larger number of the entomological publications of the world cannot examine them all and a current statement of the contents of all in compact form is invaluable. Such a department might well be made more, rather than less complete, and would secure more subscribers than any other feature."

A partial statement of the reasons leading to this change was given in the NEWS for January, 1893, p. 16. It was believed at the time that only a very few of our subscribers made any use of the notices of such papers, not of a monographic character, as were concerned with the description of insects not found in North America in the broadest geographical sense. It seemed, therefore, much better to employ this space in a manner which would prove of greater benefit to the larger proportion of our readers. Should it indeed be shown, from communications from subscribers themselves, that such extra-North American entomological notices are of interest to a larger number of persons than we supposed, then the original scope of the Literature department will be restored. The rules laid down in January were, to include notices of anatomical, physiological, embryological and monographic papers on insects wherever found, and of all papers referring to North American insects; by North America meaning all north of Panama, together with the West Indies. We believe that these rules have been given a liberal rather than an exact application.

DEPARTMENT OF ECONOMIC ENTOMOLOGY.

Edited by Prof. JOHN B. SMITH, Sc. D., New Brunswick, N. J.

The Bud Moth.—This insect, *Tmetocera ocellana*, forms the subject of Bulletin 50 of the Cornell Station, and is written by Mr. V. L. Slingerland. The life-history of the insect is very completely given, and the features in which the observations either contradict or confirm other writers are pointed out. The question of remedies is treated in some detail, but not so much to show what is useful as to show what is effective. Finally, however, the recommendation is made that the trees be sprayed very early, before the blossoms, or rather the buds open, so as to kill the hibernated larva as soon as it begins feeding. It is probable that this will prove at least partially effective.

This recommendation to spray early, is seasonable, and should be adopted by fruit growers generally, even where they are not troubled by the bud moth; but by the Plum Curculio alone. There is every reason to believe that this creature begins feeding quite early in the season, even before the buds are open in many cases, and that a spraying at this time is even more effective than one made later. Several of the most successful growers in New Jersey have informed me that they consider this first spraying. before the buds open, the most important, and that if they were limited to one application only, this would be the one chosen by them.

Mr. Slingerland again speaks of the inefficiency of kerosene in penetrating eggs, and while he has not tried it on this insect, he seems to consider that it would be ineffective. The use of this substance is probably not indicated here, but I have found it very effective in actual experiment against the eggs of at least two species of Tortricidæ, not very different in appearance from those of the Bud-moth. There seems to be, of late, a tendency to decry kerosene, just as, not so long ago, the tendency was to consider it almost a cure-all. I have never been as successful as some others in the use of this insecticide, but within a range, the exact limits of which are not yet defined, it is one of the very best that we have.

One point deserves further emphasis. It has become the practice for growers to use a combination of insecticide and fungicide, and Mr. Slingerland properly commends this. He calls attention to the fact, which I have several times referred to, that in making the combinations Paris Green must not be used with any fungicide containing Ammonia, as this is a solvent of the Arsenite of Copper. London Purple can be safely used, however, and this is one of the reasons why I generally recommend it in preference to Paris Green.

Blackberry, Raspberry and Wheat Insects: Spraying.—From the Ohio Station we have three bulletins of entomological interest, that on the Spraying issued by the Horticulturist. This is No. 48, and contains nothing that is new. Bulletins 45 and 46 are by Mr. Webster, and are com-

pilations to a large extent, especially in the case of the Blackberry and Raspberry pests. The bulletins are good, and are extremely useful to entomologists; but there is just a question whether it is the best plan to issue as a Station Bulletin a work treating of insects which have not been, and in some cases never will be injurious in the territory embraced by the State for which the Report is issued. The average farmer wants to know, and quite naturally, what to do with the pests that are troublesome in his land, and will not wade through a large pamphlet the bulk of which does not concern him. We all have our ideas of the proper, and Mr. Webster may be nearer right than I am, but I certainly would not have included *Grapta comma* among the injurious Blackberry insects on the faith of a single larva and one chrysalis found on vines in the woods. Complications of this character have an undoubted value; but they are really adapted for general works like that of Mr. Saunders, on Fruit Insects, rather than for Station Bulletins.

The Bulletin on Wheat Insects is of much more vital interest to the farmers of Ohio, and Mr. Webster speaks with more positive knowledge on this subject. It is the underground pests that are specially considered, and this brings me to another repetition of the experience of the New Jersey farmers, that where they have used the commercial fertilizers, there insects of this character do not trouble them. One of the largest growers of Onion sets in the State told me recently that he never had the slightest trouble with the Onion maggots so long as he did not use the barnyard manure, and that he had become so firmly convinced of the value of these chemical manures as insecticides that he used them exclusively. This is one of the men that really make farming pay, and his experience is suggestive.

Colorado Insects.—Some of these are treated in Bulletin No. 19 of the Colorado Station by Mr. Gillette, and the Bulletin shows that its author has not forgotten how to do good work. Quite a variety of species are treated, none of which call for special comment, save to suggest that fig. 9, of *Trypeta canadensis*, would look a little better if it had legs. We have always been under the impression that all insects had *some* legs, though in some collections the matter is left in doubt, and in figures, the Lepidoptera seldom have more than two. Mr. Gillette recommends the application of arsenites as a remedy for two species of leaf rollers that he has found injurious.

The Squash Lady Bird.—For some years *Epilachne borealis* has become steadily more abundant in the Eastern States, and has in some localities become a serious pest on Cucurbs of all kinds. In New Jersey it seems to have been more troublesome on the Watermelon than on others of the vines, but I have found it abundant on Pumpkins, Squashes, Melons and Cucumbers as well. In the April number of the NEWS I figured the mouth parts of this species in comparison with those of *Coccinella 9-notata*, to show the differences in the mandibular structure more particu-

larly. The eating done by this beetle is somewhat peculiar in that it apparently marks out its work when it starts feeding, and does not exceed the portion at any time, preferring to go to another point and start a fresh layout.

In the accompanying figure the characteristic injury is well shown. The beetle gnaws through the epidermis on the upperside, in the form of a more or less well marked semicircle and within this it feeds, sometimes

Fig. 1.—Eaten leaf.

only the upper surface, sometimes leaving nothing, but more frequently allowing a skeleton to remain. How many of these patches are eaten by one beetle I cannot say; but as they are long lived, probably a considerable number, since they are at all times feeding.

Somewhere in mid-Summer the insect lays its eggs on the underside of the leaf, in little patches of from 15 to 20, or more rarely from 30 to 40. These eggs are yellow, and resemble the eggs of the potato beetle quite closely; the accompanying figure shows their general appearance fairly well. The eggs hatch in about a week, and a little, spinous, yellow larva, makes its appearance, not unusually signalizing its entrance into the world by eating into its helpless relatives who have not yet emered from the egg, showing perhaps a remnant of the ancestral carnivorous habit. The larva feeds indifferently on the upper or underside of the leaf, but more commonly on the latter, and eats the epidermis only, and not the entire leaf tissue. The infested leaves dry up, wither and die.

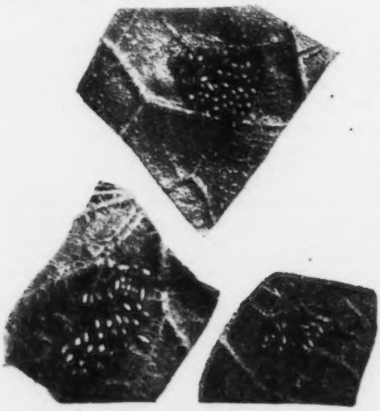

Fig. 2.—Egg patches.

Late in July, or in August, the larvæ become full grown, and then appear as shown in the figure. The spines when examined under a moderate power of the microscope are very interesting objects, branching from main stem, the branches themselves jointed as in some of the urticating larvæ. The larva attaches itself by the anal extremity and changes to a pupa, much as do the other Coccinellidæ, and this stage lasts only a few days. The beetles, after they emerge, feed very little, if at all, and soon disappear, finding Winter quarters under rubbish, in outbuildings or barns, or in fact wherever there is a crevice large enough for them to crawl into.

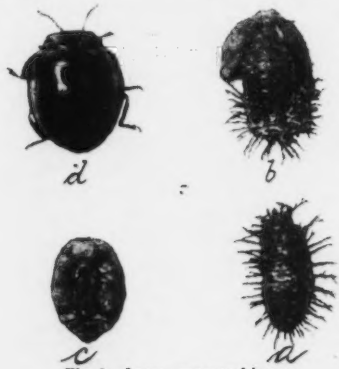

Fig. 3.—Larva, pupa and imago.

As to the remedies for this species, these are very simple: the insect feeds entirely exposed at all periods of its life, and in the imago stage on the upperside of the leaves, so that the arsenites can reach them without any trouble at all.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

[The Conductors of ENTOMOLOGICAL NEWS solicit, and will thankfully receive items of news, likely to interest its readers, from any source. The author's name will be given in each case for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for certain issue. Owing to low subscription rate, "extras" will be charged for, and when they are wanted, it should be so stated on the MS. along with the number desired. The receipt of all papers will be acknowledged.—ED.

PICTURES FOR THE ALBUM OF THE AMERICAN ENTOMOLOGICAL SOCIETY have been received from H. F. Bassett, C. H. T. Townsend, Philip Laurent, H. F. Wickham. There are many more we want who have not yet favored us with their photo.

Prof. LAWRENCE BRUNER, of the University of Nebraska, is writing a revision of the "Grouse Locusts" (Tettiginæ). In order to make the work as complete as possible, he will be pleased to receive sets of these insects from collectors in all parts of North America, including the West Indies.

To those already, or about to be, interested in the Odonata, or Dragonflies, it may be of interest to announce that the writer's catalogue of the Odonata of the vicinity of Philadelphia is expected to appear in the "Transactions" of the American Entomological Society about the close of the Summer. The paper will consist of 1. A description of the external and internal anatomy and development of the Odonata in general; 2. A catalogue of the species found near Philadelphia and of other N. American species for comparison, with brief characters and descriptions; 3. A comparison of the Philadelphia Odonat fauna with that of North America, etc. The general description will serve as an introduction to the study of this group and will be more detailed than any account previously published in English. The paper will thus be of use to American entomologists who are not concerned with the Philadelphia fauna. Illustrations will accompany the text.—P. P. C.

M. H. VIALLANES, in his latest memoir on the nervous centres and sense-organs of articulated animals (Ann. Sci. Nat. Zool. (7), xiv, pp. 404-456), summarises his results as follows:

From the point of view of the cerebral structure, *Limulus* and the Arachnids constitute a most homogeneous group, quite distinct from all the other Arthropods. In these two types the brain is composed of only two segments, protocerebron and deutocerebron, both entirely pre-œso-

phagial. The protocerebron, which innervates the eyes is strictly comparable to that of the Crustaceans, the Myriapods and the Insects; it is, however, to be remarked that in *Limulus* the pedunculated body attains proportions truly colossal. This same organ, although modified, is also recognizable in the Arachnids, where it has been described by M. Saint Remy under the name of 'stratified organ.' In the Crustaceans, Myriapods and Insects, the deutocerebron is entirely pre-œsophagial; it furnishes a root to the visceral system and innervates the first pair of cephalic appendages. It is strictly the same in *Limulus* and the Arachnids, but here the innervated appendages are called cheliceræ instead of first pair of antennæ. The first pair of antennæ are above all, organs of olfaction, while the cheliceræ are only tactile appendages physiologically analogous to the second antennæ of the Crustaceans; in *Limulus* and the Arachnids, the deutocerebron is not differentiated into olfactory lobes.* A tritocerebron comparable to that of Crustaceans and Insects is wanting in the Arachnids and *Limulus;* in these animals, the first ganglionic mass which follows the deutocerebron is exclusively concerned with the innervation of the mandible (first maxilliped in *Limulus*). The visceral nervous system of Arachnids and *Limulus* is represented only by ganglia homologous to the lateral ganglia of Insects and derive their roots from the deutocerebron; but the ganglia imparia are wanting, their absence being correlated with that of the tritocerebron. The homologies of the nervous system necessarily enter into those of the cephalic skeleton. The cheliceræ are evidently the homologues of the antennules of Crustaceans and of the antennæ of Insects. The rostrum of Arachnids being innervated by the deutocerebron cannot be completely homologous to the labrum of Insects and Crustaceans, of which the innervation is tritocerebral; the rostrum and the labrum are two analogous formations, but developed on different zonites. . . . It results from this comparative examination that the Arachnids and *Limulus* ought to be united in a single group opposed to all the other Arthropods. They may be designated under the common name of *Chelicerata* for the peculiar condition of their nervous system is connected with the absence of olfactory antennæ and the replacement of these latter by cheliceræ. The Crustaceans, Myriapods, Insects and *Peripatus* present considerable resemblances between themselves. They can be united under the name of *Antennata* to indicate that it is to the existence of olfactory antennæ that they owe the distinctive traits of their cerebral organization. The Antennata can be divided into two secondary groups: The first comprising only the Crustaceans and characterized by a complete development of the tritocerebron correlated with the existence of a second pair of antennæ. The second uniting the Myriapods, Insects and *Peri-*

* These considerations of a physiological order have led M. Saint Remy to think that the deutocerebron was not developed in the Arachnids, and that the second cerebral segment of these animals was the representative of the tritocerebron of the Crustacea; but from a strictly morphological point of view this opinion cannot be admitted, the second cerebral segment of the Arachnids having its commissure pre-œsophagial, cannot be compared to the tritocerebron, whose commissure is always post œsophagial.

patus, which are all characterized by a reduction of the tritocerebron correlated with the absence of a second pair of antennæ. The following table will show this new grouping, which, it seems to me, better expresses the affinities of the groups of Arthropods than any other.*

Arthropoda	Antennata	Biantennata	Myriapoda
			Peripatus
			Insecta
		Quadriantennata	Crustacea
	Chelicerata		Limulus
			Arachnida

A WEEVIL LIVING UNDER WATER is represented by the very rare *Eubrichius aquaticus* Thoms. lately observed at the Biological Station at Ploen, Schleswig-Holstein, Germany, by Dr. Otto Zacharias, and is apt to create great interest in entomological circles.

The little beetle in question is only a few millimeters long, but it manifests such an eminent adaptation to live under water that it deserves our full attention by all means. Without any organs particularly developed for paddling, as the water beetles proper are furnished with, this weevil moves about in the liquid element with the alertness of a *Hydrachnide*, to let itself down occasionally on a spawning-plant, or on a leaf of the *Elodea*, to rest. It swims chiefly by the two fore-legs, while the hind pair of legs are hardly used at all. From a communication of Prof. E. Taschenberg it is known of several weevils, that they occur only on water plants, and, of *Hydronomas alismatis* it is known, that it can remain under water for a long time; all these novices at aquatic existence, however, are put into the shade by the *Eubrichius*, who behaves itself amidst the water mites and *Daphnides*, etc., like one of themselves according to Dr. Kraatz at Berlin, who determined this beetle, discovered by Dr. Zacharias in the Ploen Sea; it is very rare in Germany.—AUG. MERKEL, New York.

THE PRESERVATION OF THE LARVAL FOOD BY DIGGER WASPS.—Articles relating to the habits of the digger wasps commonly mention a state of "paralysis" or "suspended animation" (Prof. C. V. Riley's account of the habits of *Sphecius speciosus*, "Ins. Life," iv, 249; April, 1892, is the latest), produced by the sting of the wasp. I have, however, observed that death is produced directly by the sting of the wasp, notably in *Nemobius* by *Lyroda subita*, and it appears that an antiseptic influence is exercised by the acid from the sting, and the sealed condition of the wasp cells helps in preserving the larval food in a fresh state. For a number of years past this view of the effect of the sting has appeared to be the correct one, but Fr. Dienelt, of Loda, Ill., was the first to make it known (see *The Observer*, Portland, Conn., April, 1892). In the case of large insects stung by the smaller wasps the poison from a single stinging has probably not caused death so speedily, hence the apparent "paralysis"

* The division of the Arthropods into Tracheata and Branchiata cannot be preserved, as it separates the Arachnids from *Limulus*, which is their nearest ally, in order to bring them close to the Insects and Myriapods from which they differ in so many respects. . . .

spoken of, but which really results the same unless the wasp larva so soon begins to feed as to cause death in that way. In the case of *Bembex* it is known that the death of its prey occurs not from stinging, but from piercing the head of the dipteron with its mandibles, hence no "suspended animation," and the storing of the fly in the wasp cell answers all necessary care in preservation, although acid may also be injected by the wasp. —Wm. Hampton Patton, Hartford, Conn.

Mr. Levi W. Mengel, of Reading, Pa., who was entomologist to the first Peary expedition to Greenland, is a candidate for the position of the United States Consul to Trinidad, W. I.

Identification of Insects (Imagos) for Subscribers.

Specimens will be named under the following conditions: 1st, The number of species to be **limited to twenty-five** for each sending; 2d, The sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly. Exotic species named only by special arrangement with the Editor, who should be consulted before specimens are sent. Send a 2 cent stamp with all insects for return of names. Before sending insects for identification, read page 41, Vol. III. Address all packages to Entomological News, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

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* Contains new species other than North American.

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ORTHOPTERA.

Acrididæ: *Dendrotettix* Riley, Ins. Life, v, p. 254; *D. longipennis*, p. 255, Texas.

Conocephalus palustris Blatchley, Can. Ent. xxv, p. 89, Ind. *Orchelimum indianense*, p. 90, Ind. *O. campestre*, p. 91, Ind. *O. bruneri*, p. 92, Ind.

Gladys (from Wellesley)—"Oh, Uncle Rufus! do look at these tadpoles in this pool; and to think that some day all those horrid things will be butterflies."

The Entomological Section

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

PROCEEDINGS OF MEETINGS.

APRIL 27, 1893.

A regular stated meeting of the Entomological Section of the Academy of Natural Sciences was held in the Hall, S. W. cor. Nineteenth and Race Streets, this evening. In the absence of the director, Mr. J. H. Ridings presided, and in the absence of the recorder, Mr. Calvert acted as such. Additions to the Cabinet of the American Entomological Society were presented as follows: one ♂ *Aeschna juncea*, one ♂ *A. verticalis* from Mr. Calvert; Jamaican ants, four species, from Mr. J. Percy Moore; new Hymenoptera, six species, from Mr. Charles Robertson; twenty-three species of European Hymenoptera new to the collection from Mr. Ernest André in exchange; eight specimens of a new species of *Entechnia* from Prof. J. T. Aldrich. Papers No. 280, 281 and 282, were presented for publication and referred to the Publication Committee. Mr. Fox called attention to the new species of *Entechnia*, presented by Prof. Aldrich, which has the tongue much longer than in any other species of the genus. The eight specimens shown were apparently all females, and were collected at Hot Springs, South Dakota, by Prof. Aldrich.

PHILIP P. CALVERT, *Acting Recorder.*

The following papers were read and accepted by the Committee for publication in ENTOMOLOGICAL NEWS:

AN ANOMALOUS EMPID.

By D. W. COQUILLETT, Los Angeles, Cal.

Among the Diptera collected by the writer during the past season is a single specimen, which, while undoubtedly belonging to the Empidæ, differs from all other members of this family known to me, in that the anal cell is open. Indeed, this is the principal character employed by Dr. Loew for separating the Bombylidæ from the Empidæ. The present form, however, has much more affinity with the latter family than it has with the Bombylidæ. The spherical head attached to a distinct neck; the absence of labellæ; the very short first antennal joint, and the long, robust terminal style; the very gibbous thorax, and narrow, elongated abdomen; finally, the absence of the second submarginal cell in the wings, are characters which pertain to the Em-

pidæ, but not to the Bombylidæ. The almost complete obliteration of the first section of the fourth vein finds its parallel in the Empid genus *Syndyas*, but so far as I am aware, is not known to occur in any Bombylid genus. The course of the second vein, closing the marginal cell, is a character not known to me as occurring in either of the above-mentioned families. Still, this character, as well as the other neurational ones, cannot be considered of sufficient importance to exclude the present form from the Empidæ, and it will best be located in the subfamily Hybotinæ.

The following is a description of this new form:

MYTHICOMYIA n. gen.

Body destitute of macrochætæ. Head globular, attached to a distinct neck. Antennæ porrect, two-thirds as long as head; first joint very short, the second as broad as long; third joint broadly lanceolate, not annulate, nearly three times as long as the second; style terminal, nearly half as long, and one-third as broad as the third joint, very densely pubescent. Eyes of the male contiguous, and with an area of enlarged facets above. Three widely separated, equidistant ocelli present. Proboscis rigid, nearly as long as heighth of head, projecting obliquely forward, destitute of labellæ; palpi minute. Thorax greatly arched, in profile higher than long. Wings having the marginal cell closed; only one submarginal and four posterior cells, all of them open, as is also the anal cell; first section of the fourth vein colorless, the last, or seventh vein, very weak. Neuration as shown in the accompanying figure. Legs rather robust, but none of the parts dilated, destitute of bristles, spines and other processes; front coxæ less than half as long as their femora; pulvilli well-developed, empodium bristle-like. (Name from the Greek *Muthikos*, legendary, and *muia*, a fly.)

MYTHICOMYIA RILEYI.

Mythicomyia rileyi n. sp.—Black, the frontal triangle, face, humeri, base of the first and apices of the other abdominal segments excepting the last, apex of femora, tibiæ wholly, and the halteres white, the short, sparse hairs also white; occiput, thorax and abdomen gray pollinose, the hypopygium shining, one and one-third times as high as long, shorter than, but projecting one-fourth its height above the eighth abdominal segment. Wings wholly hyaline. Length 2.5 mm.

Kern County, Cal. A single specimen in May.

It is with much pleasure that I dedicate this rare and very interesting species in honor of our national entomologist, Dr. C. V. Riley.

The accompanying figure is from a camera-lucida sketch, drawn with the assistance of Miss Grace G. Kingsley, of this city.

———o———

COLORADO CYNIPIDÆ.—Part IV.

By C. P. GILLETTE, Fort Collins, Colorado.

HOLCASPIS.

H. colorado n. sp.

Gall.—I have two small twigs, each containing a cluster of three galls that resemble small, dark colored galls of *H. rugosa* Bass. The galls are slightly drawn out into a blunt point; the largest measures three-eighths of an inch in length by five-sixteenths of an inch in breadth. The substance of the galls is more dense than in *rugosa* or *globulus*, and the central cell does not separate from the surrounding cellular tissue.

Gall-fly ♀.—Black, shaded with rufous. Length 3.6 mm. *Head* dark rufous, with parts bordering mouth, middle portion of face and vertex black, or nearly so; antenna 13-jointed, black, third joint slightly longer than the fourth. *Thorax* rather coarsely punctured, and from each puncture arises a gray hair; the general color of the thorax is black, but there is a tinge of rufous upon the shoulders and between the parapsidal grooves; parapsidal grooves black, and rather broad at the scutellum, but extending only about half way to the collar; median groove wanting, parallel lines extending back from the collar distinct, lines over base of wings black, smooth and shining; scutellum grooved at base, rugose, sparsely haired, and darker in color than the mesothorax; pleuræ densely punctured, the punctures giving rise to fine white hairs. *Abdomen* black polished, second segment with fine pubescence on the sides near the base, second segment hardly covering more than one-third of the dorsum; the abdomen is truncate and compressed laterally, the greatest depth from the dorsum to the venter being greater than the length. *Wings* hyaline, 4.2 mm. long; nervures black, but not heavy; areolet rather large. *Feet* blackish, tinged with rufous; tibiæ darker than femurs.

Described from one living female cut from the gall Oct. 31, 1892. The galls were taken at Manitou, Col., September 30th.

BELONOCNEMA.

B. colorado n. sp.

Gall-fly ♀.—General color dark rufous; head entirely rufous, but rather lighter in color than the other parts of the body. *Head:* Facial carina rather prominent, labrum elevated at the free end and slightly notched,

sculpturing of face consisting of fine impressed lines outlining small, more or less hexagonal areas; mandibles and palpi pale yellowish, ocelli approximate, a tinge of black about the base of each, occiput slightly tinged with black; first joint of antenna rufous, second tinged with same color, the following joints black, third joint as long as fourth and fifth together. *Thorax* smooth and shining, parapsidal grooves very distinct, median groove absent; scutellum rugose, without foveæ, but with broad basal groove; pleuræ of pro- and meso-thorax smooth and shining, the meso-thorax striated on a small part of its upper surface immediately beneath the base of the wing; the pro-thoracic pleuræ are sparsely punctured and near the anterior coxæ are striated. *Abdomen* dark rufous shading into black at the tip, the second segment bearing a few scattered hairs at the side. *Wings* hyaline, nervures distinct, but without smoky margins, radial nervure long and but little curved, and the radial cell long and narrow, cubital nervure reaching the first transverse areolet medium in size; length 5.5 mm. *Feet* dark rufous, the femora being lightest in color.

Described from a single female taken by the writer at Dolores, Col., June 18, 1892.

———o———

THREE NEW SPECIES OF PAMPHILA.

By Dr. HENRY SKINNER, Phila., Pa.

Some weeks ago while on a visit to Reading, Pa., and looking over the Hesperidæ in the wonderful collection of Lepidoptera belonging to Dr. H. Strecker, I found these three new species, and was kindly allowed to take them home with me for study and description:

Pamphila streckeri n. sp. ♂.—Expanse 1.25 inches. This is a yellow fulvous species with a narrow dark brown border to all wings. *Primaries:* yellow-fulvous, except the dark border, which is about one-eighth of an inch in width. The stigma is a long, narrow, black line, extending from median nervure to submedian nervure, crossing obliquely two nerve spaces; at the end of cell there is a distinct, black, V-shaped mark, composed of two lines with the point toward tip of wing. *Secondaries:* these are yellow-fulvous, with a dark border similar to primaries, except that on primaries there is no fuscous on costa, except at tip, whereas in secondaries the dark border extends all around and widens toward base of wings. The border on exterior margin of secondaries is narrower than on primaries, and the yellow-fulvous of central area of wing runs into it in marked indentations, there being four well-defined teeth. Fringes to all wings yellow-fulvous. *Underside:* primaries same as above, excepting that there is the usual dark basal mark; the border is same width as above, but lighter in color, and the yellow veins run through it giving the fuscous a dentate appearance; and the yellow-fulvous

fringe is separated from wing by a remarkably distinct and well-defined black line. The secondaries are greenish gray with the nerves lemon-yellow, making a distinct and curious combination; the interspace between the last median and the submedian nervure is bright yellow-fulvous; fringe and black line same as on primaries.

This is a remarkable species, and can be readily recognized by character of stigma, dentate fulvous on secondaries above, and by the marking of secondaries below. Above the species looks like *delaware*, only it is darker in color, and below it reminds one very much of *Thymelicus poweschiek*.

Described from one ♂ in the collection of Dr. Strecker, after whom I have named it. The specimen came from Florida.

Pamphila yehl n. sp. ♂.—Expanse 1⅜ inches. This species looks considerably like *aaroni*, and the superiors are marked not unlike *pawnee*, thus having a heavier stigma than *aaroni*. *Upperside:* primaries yellow-fulvous, with a brown border three-sixteenths of an inch in width; three yellow-fulvous subapical spots situated in the brown border, the border extending inwards from these to the end of cell; stigma rather wide and mud-color in the middle, it is faintly divided in two by the nervure; beyond the stigma and extending to brown border are two quadrate, yellow-fulvous spots, and at outer end of stigma a small **V**-shaped one, and at end of this and directly below the extra discal spots is another minute **V**-shaped spot. *Secondaries:* centre yellow-fulvous, with a dark brown border extending all around; the yellow-fulvous is broken into four distinct parts by the nerves, with an extra one in the cell. *Underside:* there is nothing characteristic about primaries below; secondaries are light cinnamon-brown in color (much like *leonardus*); in the centre of the wing, closely placed, there is a semicircle of four yellowish round spots, with an additional one placed more inwardly toward the base.

These spots are not nearly so well defined as in *leonardus*. The species comes near *aaroni*.

One specimen from Florida in collection of Dr. Strecker.

Pamphila alcina n. sp. ♂.—Expanse 1.5 inches. *Upperside.* Primaries: stigma black and well marked; three subcostal spots showing not very distinctly in the fulvous of costa; taking on artificial line from subcostal spots through stigma to inferior margin, the whole of this area to base of wing is fulvous; external to the stigma are two fulvous spots one above the other; the lower one is quadrate, and the other a triangle enclosed by the nerves; the fulvous extends along interior margin to outer margin of wing; the remaining part of wing is brown; the inferiors are brown, with the central area covered by ill-defined fulvous spots and scales. *Underside* of inferiors greenish fulvous, immaculate.

From three male specimens from Colorado; two in coll. of author and one in coll. Dr. Strecker.

This species comes closest to *manataaqua* and *cernes*, but is larger than either and lighter in color.

———o———

Notes on LITHOSIIDÆ and ARCTIIDÆ, with descriptions of new varieties.—I.

By B. NEUMOEGEN and HARRISON G. DYAR.

(Continued from page 143.)

E. nais Dru. ♂.—Thoracic vestiture shaggy. Head and collar above pale ocher-yellow, rarely with two black spots on the collar; thorax pale ocher-yellow, with three black stripes; abdomen same color with a broad dorsal black band, broadest centrally. Below, nearly entirely black; fore wings black, with pale ocher-yellow marks; when complete, these are as follows: a costal line from base two-thirds length of wing (but the costal edge is black), a median band from base to end of cell, where it is bent at right angles to touch costal band, and sends off at its middle below a branch to internal angle; a terminal **W**-shaped mark, the upper limb of which does not quite attain costa; its central angle joins the angle of the median band, and its lower limb the branch at about the middle of the latter; the fringe and internal margin are also pale ocher-yellow; usually the outer part of these marks is more or less obsolete, and the **W** mark and branch of median band may be entirely absent; hind wings pale ocher-yellow, shading to darker at the central basal area, rarely overspread with a light red shade in this portion. There is one marginal, three submarginal, an elongate apical, and one small discal spot, all variable in size, sometimes partly absent, or enlarged and confluent. Expanse 32–39 mm.

Female differs from ♂ in the smooth thoracic vestiture; the marks on the collar are more generally present than absent; the color of hind wings and abdomen is a darker ocher, and the marginal black spots tend to be larger becoming confluent, and occasionally forming a complete black border. Expanse 32–35 mm.

E. phalerata Harris.—Thoracic vestiture of ♂ smooth and even, or very slightly shaggy; the black marks on collar and thorax distinctly present. Abdomen pinkish red with dorsal black stripe; below entirely black; fore wings black, with pale ocher-yellow markings, with a slight flesh-colored tint. The pattern is as in *nais*, but the costal edge is yellow, and the markings never show a marked tendency to become obsolete. The costal band extends almost to the apex and the upper limb of **W** mark joins it; rarely it is disconnected and shortened, but this is the extent of variation; hind wings pale ocher-yellow, pinkish red along abdominal margin; the color fades away outwardly, but often largely overspreads the wing; black marks as in *nais*, but the discal dot is usually larger, while the spots do

not usually become confluent, though they are often reduced in size or entirely absent. Expanse 34–38 mm.

Female differs from ♂ in the smoother thoracic vestiture, though the difference is not marked, and in the color of hind wings, which are crimson-red, the black spots larger than in ♀, but usually not confluent. Expanse as in ♂.

E. vittata Fab ♂.—Thoracic vestiture shaggy, but less so than in *nais*, black spots on collar absent. Abdomen ocher-yellow, with a broad black dorsal band, which widens posteriorly and covers nearly the whole of the last abdominal segment; fore wings black, marked as in *nais*, but the costal edge is yellow nearly to apex, as it is in *phalerata*. The terminal **W** mark is even more invariably obsolete than it is in *nais*, the marks being sometimes reduced to the costal and median longitudinal lines; hind wings ocher-yellow or red, the spots almost always decidedly confluent, and frequently forming a complete border. Expanse 38–43 mm.

In the ♀ the thoracic vestiture is smooth, the black spots are often present on the collar; the abdomen is more covered with black posteriorly, while the marks on the fore wings are usually more reduced and the marginal black band of secondaries often covers more than half the wing; otherwise as in the ♂.

Mr. Dyar is prepared to show from the differences in the ♂ genitalia that these three forms are entited to specific rank, and we are informed by Mr. J. Doll that the larvæ of *phalerata* and *decorata* (= *vittata*) differ strikingly in appearance.

Hypercompa caja Linn.

The typical form with red hind wings occurs in the Pacific Northwest, as we learn from Prof. O. B. Johnson.

Var. *americana* Harris.

This inhabits the Northeastern part of the continent.

Var. *utahensis* Hy. Edw.

The white marks are more extensive, the hind wings yellow.

Var. *transmontana* n. var.

This a Western varietal form, still more extreme in its markings than var. *utahensis* Hy. Edw., coming, in its profusion of white on primaries, very near *H. wiskotti* Stgr. from Asia Minor. The ground color of primaries is white, with the following maculation in blackish brown. Three irregular, broad, transverse stalks from basal half of costa, converging below cell in submedian space and followed by a large blotch, either subovate or subquadrate, resting on basal half of internal margin. A large,

subquadrate spot, angulated outwardly, from apical part of costa to veins 5–4, and another broader blotch similarly notched at outer edge, resting on internal margin near angle, sharply pointed at conjunction with vein 3. The interspace between veins 3 and 4 as well as the anterior margin is entirely immaculate white. Apical blotches either wanting or minimal; a narrow terminal line; small basal dots from costa to internal margin. Secondaries light yellow; no discal dots, but large transverse dots of steel-blue in basal part of cell, and from one to three submarginal dots of same color. Below, the maculations of primaries are more reduced, only two stalks from costa, which converge in cellular interspace, the stalk nearest base wanting. The large subovate blotch in basal half on internal margin, more or less obsolete. Basal dots absent; secondaries as above.

Hab.—Western Colorado. Caught by Mr. D. Bruce in several examples. Types in Mr. Neumoegen's collection.

Var. *opulenta* Hy. Edw.

As originally suggested by the describer, this must be only a variety of *caja*. It is distinctly led up to by the form described above.

Genus **ZATREPHES** Hüb.

Head rather small, front higher than wide, narrowing a little below, smooth, slightly convex; ocelli present, eyes large, globose, naked; antennæ inserted over the eyes, very far apart, simple, minutely ciliate; palpi exceeding the front by more than half their length, ascending; tongue long, strong, coiled. Thorax as long as broad, with smooth vestiture of hair and scales. Abdomen moderately stout, exceeding the secondaries; the terminal joints conical. Legs slender and closely scaled, long, subequal; posterior tibiæ with two pairs of short spurs, tarsi very slightly spinuated with two claws at tip; fore wings produced at apex, costa slightly and evenly convex, outer margin very oblique; wing more than twice as long as broad; vein 1 free, subsinuate, median four branched, veins 3–5 arising very close together and remote from 2; cell closed, the cross-vein deeply bent inwards below the middle, the upper part oblique; 6 from apex of cell; 7–10 on a stalk from origin of 6, vein 10 running very close to the others; 11 arises from the subcostal and is also much crowded in the narrow costal space; 12 free, with a loop near base below to receive the frenulum of secondary; hind wings tri-

gonate, costa and outer margin slightly convex; 2 internal veins; median three branched; cell broad, closed by a slightly concave vein; 5 arises below the middle of cross-vein; 6 is a continuation of the subcostal; 7 arises from subcostal before end of cell, 8 wanting.

This genus seems hardly to belong to the Arctiidæ. In the position of the median venules of the hind wings it is like the Agaristidæ, but vein 8 is entirely absent.

Z. trigona Grt.—This differs from its ally, *Z. specularis* H. S., as follows: Head, collar and patagia in *specularis* uniformly yellowish gray; in *trigona* mouse-gray, with a central line and rims of collar, as well as the edges of patagia, of rose color. Primaries above: the hyaline space in *specularis* runs from costa in three small undulations to within outer margin, then loops inwardly, skirting the discal area in two large bows back to costa. In *trigona* it is a simple curved line, keeping at a distance from the outer margin, resting with a sharp inner hook on median vein and then traveling back to costa in a curve. In *specularis* it is strictly hyaline; in *trigona* the space is powdered with straw-yellow, both having the black granules; the space of costa covered by hyaline blotch is 8–9 mm. in *specularis;* 5–6 mm. in *trigona.* The apical area in *specularis* is yellowish gray, the costa being yellow, while in *trigona* it is blackish gray, with a red apical costa. In *specularis* the intersection of nerves at outer margin is light gray, in *trigona* it is black; besides there is a narrow, but bright yellow marginal band in *trigona.* A rose colored, small basal dash and a small reddish line at angle of *trigona.* In *specularis* there are two small yellowish basal dots, one resting on median and the other on submedian vein. In *trigona* there are two large basal dots, very often confluent, thus forming an irregularly square, basal yellow field; besides, there is always in *trigona* an irregular, yellowish blotch, covering the median space between this basal field and the hyaline costal area, most intense in color near base and fading towards angle. Secondaries in *specularis* strictly hyaline, with a brownish marginal rim and a light shade of rose along anal margin. In *trigona* more opaque, whitish hyaline, no marginal rim, but an intensely rose-colored area along anal margin; anterior margin of *specularis* slightly curved at centre and somewhat pointed at angle, while in *trigona* it is well rounded. Primaries below in *specularis,* as well as the nerves, whitish gray, with a rose-colored dash along costa from inner rim of hyaline space pointing towards base. In *trigona* the most intense rose color, with the exception of apical space, which is dark gray, crossed by rose-colored veins and a marginal white tint along inner margin. Expanse of wings: *specularis* 38–40 mm.; *trigona* 33–35 mm.

The specimens before us are from Mexico, Chiriqui Bay and Venezuela in *specularis;* and from Colorado and the Southwest in *trigona.*

EXCHANGES

Not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at end of the column, and only when necessary those at the top (being longest in) are discontinued.

Coleoptera.—Price-lists wanted.—J. H. Bomberger, Box 76, Columbiana, O.

Lepidoptera.—Cocoons of *Attacus columbia* Smith to exchange for native lepidoptera, or for books on North American lepidoptera.—Robert H. Wolcott, Phi Delta Theta House, Ann Arbor, Mich.

Lepidoptera.—I am studying the Noctuid genera *Euclidia*, *Drasteria* and *Litosea*. Specimens bought, exchanged or determined.—M. V. Slingerland, Cornell Insectary, Ithaca, N. Y.

Lepidoptera.—Wanted to purchase cocoons and larvæ from different parts of U. S. State name and price.—E. J. Kruegeman, 54 May St., Lake View, Chicago, Ill.

Lepidoptera.—Wanted to exchange, papers on N. Am. Lepidoptera for Noctuidæ or Heterocera generally. Noctuidæ named for privilege of retaining desiderata.—John B. Smith, New Brunswick, N. J.

Coleoptera of N. Am. and Mexico wanted by purchase or exchange; large collection.—Fred. C. Bowditch, Tappan St., Brookline, Mass.

Lepidoptera.—Wanted, *Plusia balluca*, *metallica* and *ampla;* also the Hydrœcias. Have some of the rarer eastern Noctuids for exchange.—Henry Bird, Rye, N. Y.

Coleoptera and **Hemiptera**, European and exotic, also postage stamps of Roumania, offered for American Hemiptera-Heteroptera unnamed.—A. L. Montandon, Strada Viilor filarete, Bucarest, Roumania.

Phryganidæ wanted; will exchange choice Coleoptera and Lepidoptera from Kansas, Colorado and New Mexico (Prof. F. H. Snow's collecting) for Caddice-flies, U. S. or exotic.—Vernon L. Kellogg, Univ. of Kansas Lawrence, Kansas.

Lepidoptera.—Good exchange or cash given for specimens of *Nadata doubledayi* Pack. Also wanted any of the rarer Notodontidæ and Limacodidæ.—Harrison G. Dyar, 599 Broadway, New York City.

Coleoptera.—I wish to obtain Entomological literature in any language, especially that treating of Coleoptera and for works not in my possession will give good insects from the West and from Alaska, mostly Coleoptera.—H. F. Wickham, Iowa City, Iowa.

Lepidoptera.—I have for exchange *C. semidea*, *A. montanus*, *S. modesta* (imagos and pupæ), and other White Mountain material. The rarer Sphingidæ preferred.—R. Ottolengui, 115 Madison Ave., N. Y.

Lepidoptera (diurnal) of Iowa to exchange for species of same order not in my collection.—Henry G. Willard, Grinnell, Iowa.

Celeoptera.—Price-lists wanted.—Dr. E. B. Stephens, Plymouth, Mass.

Cynipidæ.—Named or unnamed Cynipidæ wanted by purchase or exchange. Always accompany the flies with their galls when possible.—C. P. Gillette, Ft. Collins, Col.

Orthoptera.—For exchange: Mexican Lepidoptera, unmounted, for literature, in any language, on N. A. Orthoptera. Also Indiana Orthoptera for others from any part of N. A.—W. S. Blatchley, Terre Haute, Ind.

Orthoptera.—I desire to procure, by purchase, exchange, or for identification, specimens of the genus *Spharagemon* from all parts of the country.—Albert P. Morse, Wellesley College, Wellesley, Mass.

Lepidoptera.—Cocoons and pupæ of the rarer moths, *luna*, *imperialis*, *regalis*, *P. fraterna*, *P. pithecium*, etc.; also many fine set specimens; hybrids from *selene* et *luna*, *ceanothi* et *cecropia*, *Gloveri* et *cecropia*. List exchanged.—Emily L. Morton, Newburgh, N. Y. (New Windsor delivery).

Lepidoptera.—I will exchange or sell specimens (imagos or larvæ) from Illinois for those of other localities. Have on hand prepared sets of last year's collecting.—Arthur J. Snyder, North Evanston, Ill.

Lepidoptera.—Prepared larvæ, live pupæ, Coleoptera and Reptiles from America desired in exchange for species of Europe.—A Voelschow, Schwerin in Mecklinburg, Germany.

Lepidoptera, Coleoptera and **Hemiptera** of Colorado for exchange.—E. V. Beales, 1650 Larimer Street, Denver, Col.

Coleoptera for exchange: good species in perfect condition. Cicindelidæ, Endomychidæ and *Leptura* are especially wanted.—L. B. Walton, Box 123, Keuka College, Yates County, N. Y.

Lepidoptera.—I wish to exchange large, sound pupæ of *Cecropia* and *Polyphemus* for pupæ or imagines of almost any other species of Lepidoptera.—James Tough, 234 S. Water Street, Chicago.

Lepidoptera.—American diurnals wanted. Will buy or exchange. Hesperidæ and Lycænidæ especially desired.—Henry Skinner, Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera.—A few rare Indian Lepidoptera to exchange for rare species from the Northwest.—Levi W. Mengel, Reading, Pa.

Odonata.—Dragonflies. Species not in my collection wanted from all parts of the world. N. American species given in exchange, or named by special agreement.—P. P. Calvert, Acad. of Nat. Sciences, Phila., Pa.

Lepidoptera.—Imagines and pupæ of New England species for pupæ of *Megathymus yuccæ* and *Sphinx catalpæ*.—Field Brothers, Guilford, Ct.

Coleoptera and **Lepidoptera.**—I desire to exchange specimens with collectors in the South and West who wish to extend their collections; correspondence solicited.—F. W. Russell, M.D., Winchendon, Mass.

I am desirous of collecting in any of the Orders in Northwestern Ohio; write me.—N. Sager, Jr., Herring P. O., Allen Co., Ohio.

Diurnal Lepidoptera.—I will be pleased to correspond with collectors with view to exchanging Lepidoptera of the world. I usually have 2000 or 3000 mounted duplicates on hand, in perfect condition.—A. G. Weeks, Jr., 360 Washington St., Boston.

Correspondence and exchange of insects desired with young entomologists, especially in the Southern and Western States and Mexico.—Stewart N. Dunning, 43 Niles St., Hartford, Conn.

I desire to dispose of Japanese insects by sale or exchange; correspondence solicited.—Otoji Takahashi, Tokio, Japan.

IN PREPARATION

A LIST OF ALL PERSONS INTERESTED IN THE

STUDY OF INSECT LIFE.

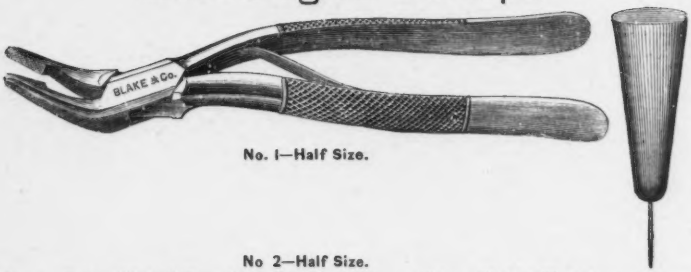
It is the desire of the undersigned to make as complete a List as possible of those persons in this country who are interested in the **study of INSECT LIFE.** Will the readers of **ENTOMOLOGICAL NEWS** kindly assist in the matter by sending us on postal cards the address of all such as are known to them in their vicinity, together with mention, if possible, of the Order or Orders in which they are specially interested?

Address: **J. H. RIDINGS, Secretary,**

American Entomological Society,

P. O. BOX 248, Philadelphia, Pa.

Entomological Forceps.



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